

## PATENT ABSTRACTS OF JAPAN

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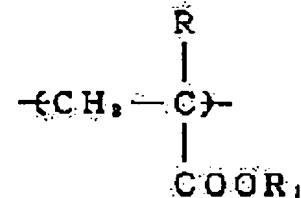
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## (54) ADDITIVE FOR INK JET RECORDING AND RECORDING MEDIUM

## (57)Abstract:

PURPOSE: To enhance color forming properties, water resistance and light fastness by using a polymer obtained by polymerizing acrylic ester represented by a specific formula and a copolymerizable nonionic vinyl monomer other than (meth)acrylic ester in a specific ratio as an effective component.

CONSTITUTION: In an ink jet recording medium forming a recording image having high resolving power and excellent in color forming properties, water resistance and light fastness using aq. ink, an additive for ink jet recording containing a polymer obtained by polymerizing 50-100mol% of (meth)acrylic ester represented by formula (R is hydrogen or a methyl group and R1 is a 1-2C alkyl group, that is, a methyl group or an ethyl group) and 9-50mol% of a copolymerizable nonionic vinyl monomer other than (meth)acrylic ester as an effective component is internally added to a support or applied to the support. In this case, a cationic dispersion is pref. prepared in order to uniformly fix ink.



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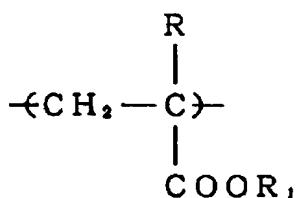
## CLAIMS

## [Claim(s)]

[Claim 1] The additive for ink jet record which makes an active principle the polymerization object which carried out the polymerization of the Nonion nature vinyl monomer which can be copolymerized except 50 thru/or 100-mol % and the above-mentioned acrylic ester (meta) for the acrylic ester expressed with the following general formula (1) (meta) at 0 thru/or 50-mol % of a rate, and has cationicity.

General formula (1)

[Formula 1]

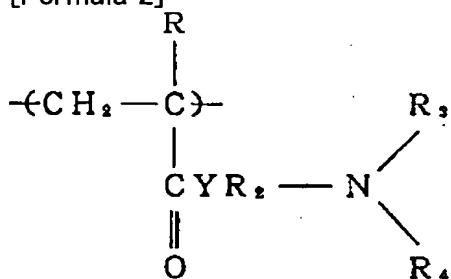


However, R is hydrogen or a methyl group, and R1. Methyl or an ethyl group is shown.

[Claim 2] They are a polymerization or the additive for ink jet record according to claim 1 which comes to carry out copolymerization at the rate below 10 mol % about the monomer which has quarternary ammonium salt expressed with the monomer and/or formula (3) which have the third class amino group shown by the formula (2).

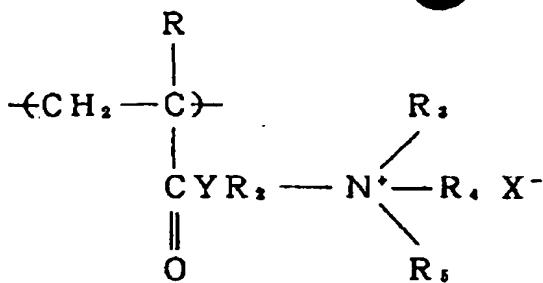
General formula (2)

[Formula 2]



General formula (3)

[Formula 3]



However, R is hydrogen or a methyl group, and R2, C1 – C4 An alkylene group or CH<sub>2</sub> CH(OH) CH<sub>2</sub> It is shown. R3, R4, and R5 Hydrogen, or C1 – C4 An aliphatic series alkyl group or benzyl is shown. Y shows O or NH. X – An anion is expressed and they are halogen ion, sulfate ion, alkyl-sulfuric-acid ion, alkyl or aryl sulfonic-acid ion, and acetic-acid ion.

[Claim 3] The monomer which has quarternary ammonium salt shown by the monomer and/or formula (3) which have a surfactant containing quarternary ammonium salt, and the third class amino group expressed with a formula (2) less than [ more than 50 100 mol % ] A polymerization or the polymerization object which it comes to copolymerize, And the additive for ink jet record containing one or more sorts chosen from the group which consists of a polymerization or a polymerization object which it comes to copolymerize in the monomer which has quarternary ammonium salt shown by the monomer and/or formula (3) which have the third class amino group expressed with a formula (2) according to claim 1 or 2.

[Claim 4] The monomer which has quarternary ammonium salt shown by the monomer and/or formula (3) which have a surfactant containing quarternary ammonium salt, and the third class amino group expressed with a formula (2) less than [ more than 50 100 mol % ] A polymerization or the polymerization object which it comes to copolymerize, And under one or more sorts of existences chosen from the group which consists of a polymerization or a polymerization object which it comes to copolymerize, the monomer which has quarternary ammonium salt expressed with the monomer and/or formula (3) which have the third class amino group expressed with a formula (2) The manufacture approach of the additive for cationic ink jet record which carries out the polymerization of the Nonion nature vinyl monomer which can be copolymerized except 50 thru/or 100-mol % and the above-mentioned acrylic ester (meta) for the acrylic ester expressed with a formula (1) (meta) at 0 thru/or 50-mol % of a rate. [Claim 5] They are internal or the record medium which comes to carry out coating to a base material about the additive for ink jet record according to claim 1 to 3.

[Claim 6] The record medium for ink jet record which does not mix or blend a pigment but comes to carry out coating only of the additive for ink jet record according to claim 1 to 3 to a base material.

[Claim 7] The monomer which has quarternary ammonium salt shown by the monomer and/or formula (3) which have a surfactant containing quarternary ammonium salt, and the third class amino group expressed with a formula (2) less than [ more than 50 100 mol % ] A polymerization or the polymerization object which it comes to copolymerize, And under one or more sorts of existences chosen from the group which consists of a polymerization or a polymerization object which it comes to copolymerize, the monomer which has quarternary ammonium salt expressed with the monomer and/or formula (3) which have the third class amino group expressed with a formula (2) The acrylic ester expressed with a formula (1) (meta) 50 thru/or 100-mol %, The process which carries out the polymerization of the Nonion nature vinyl monomer which can be copolymerized except the above-mentioned acrylic ester (meta) at 0 thru/or 50-mol % of a rate, and obtains the additive for cationic ink jet record, The manufacture approach of the record medium for ink jet record which turns into a base material from internal or the process which carries out coating in this additive for ink jet record.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

#### [0001]

[Industrial Application] This invention relates to the record medium which used internal or the additive by which coating is carried out, its manufacture approach, and it for the record medium used for an ink jet recording method. It is related with the new additive which offers the record ingredient which forms the record image which was excellent in color enhancement, a water resisting property, weatherability, and lightfastness in detail with high resolution.

#### [0002]

[Description of the Prior Art] As the record medium for former and ink jet record, In order to raise the absorptivity of ink and to raise image concentration, as it is in (2) JP,56-148585,A which carries out paper making so that it may become whenever [ low size ], the general paper which used (1) pulp as the principal component Approaches, such as using a porous inorganic pigment and preparing an ink absorption layer on the low base paper of ink absorptivity, such as common paper of fine quality, and in order to raise the water resisting property of a record image again (3) As it is in JP,62-11678,B, the approach of making a basic latex polymer contain as a deck-watertight-luminaire-ized agent etc. is learned.

#### [0003]

[Problem(s) to be Solved by the Invention] By the way, the more advanced property is demanded also from the record medium for ink jet record with multiple-color-izing or improvement in the speed of record. That is, in order to obtain the color picture of high definition and high resolution in an ink jet recording method, it is needed for a record medium to fulfill many following properties.

(1) It is excelling in the color enhancement of ink and an image with high optical density and saturation being obtained, (2) ink's not permeating too much and a sharp image's being obtained, the ink droplet which carried out (3) adhesion being promptly absorbable, and excelling in the shelf life of (4) record images (excelling in a water resisting property, lightfastness, etc.). since [ however, ] it is necessary to absorb a lot of ink and to fix it quickly for filling these engine performance -- a pigment -- coating -- carrying out -- in addition -- and the coating layer must be thickened. Although problems, like that it cannot be used as a large electrophotography record form and the scarce burden on manufacture which paper powder tends to generate serves as the cost high are in note nature as the result, the record medium for ink jet record which solved these problems is not yet found out. Then, this invention satisfies each above-mentioned military requirement, and aims at offering the record medium for ink jet record which also fills the following military requirements simultaneously.

(1) the general engine performance (reinforcement, a printability, note nature, etc.) as excelling in compatibility with a recording device (generating neither paper powder nor curl), and (2) recorded materials -- \*\*\*\* -- that it is and the things (electrophotography record, dot record, etc.) which can be used also for a recording method besides (3).

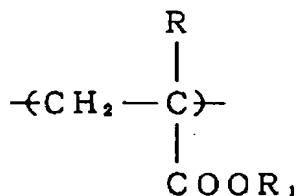
#### [0004]

[Means for Solving the Problem] In the record medium for ink jet record which forms a record image using the water color ink in which this invention persons contained water soluble dye, In

order that the additive for ink jet record with which this record medium makes an active principle the polymerization object which carried out the polymerization of the Nonion nature vinyl monomer which can be copolymerized except 50 thru/or 100-mol % and the above-mentioned acrylic ester (meta) for the acrylic ester expressed with the following general formula (1) (meta) at 0 thru/or 50-mol % of a rate might manufacture the above-mentioned record medium, it found out that it was internal or suitable for carrying out coating to the base material.

[0005] That is, this invention is an additive for ink jet record which makes an active principle the polymerization object which carried out the polymerization of the Nonion nature vinyl monomer which can be copolymerized except 50 thru/or 100-mol % and the above-mentioned acrylic ester (meta) for the acrylic ester expressed with the following general formula (1) (meta) at 0 thru/or 50-mol % of a rate, and has cationicity.

[Formula 1] General formula (1)



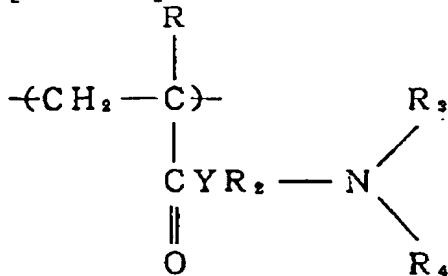
However, R is hydrogen or a methyl group, and R1. C1 – C2 An alkyl group, i.e., methyl, or an ethyl group is shown.

[0006] Internal or in case it is used carrying out coating, in order to fix the polymerization object used by this invention to a base material and to fix ink to homogeneity, it is desirable that it is a cationic distribution object. As the approach of giving cationicity to the polymerization object of this invention, The polymerization object which carried out the polymerization of the Nonion nature vinyl monomer which can be copolymerized except the acrylic ester 50 only shown by the formula (1) (meta) thru/or the acrylic ester (meta) of the 100-mol % and the above at 0 thru/or 50-mol % of a rate, The monomer which has quarternary ammonium salt shown by the monomer and/or formula (3) which have a surfactant containing quarternary ammonium salt, and the tertiary-amine radical shown by the formula (2) 50 thru/or a 100 mol % polymerization, or the polymerization object which it comes to copolymerize, And others [ approach / of mixing one or more sorts chosen from the group which consists of a polymerization or a polymerization object which it comes to copolymerize in the monomer which has quarternary ammonium salt shown by the monomer and/or formula (3) which have the tertiary-amine radical shown by the formula (2) ], \*\* How to carry out an emulsion polymerization under existence of the cationic surfactant which has quarternary ammonium salt, \*\* Or copolymerize. the monomer which has quarternary ammonium salt expressed with the monomer and/or formula (3) which have the third class amino group expressed with a formula (2) -- 50 thru/or a 100 mol % polymerization -- How to carry out the polymerization of the Nonion nature vinyl monomer which can be copolymerized except the acrylic ester 50 shown by the formula (1) under existence of the becoming polymerization object (meta) thru/or the acrylic ester (meta) of the 100-mol % and the above at 0 thru/or 50-mol % of a rate, \*\* Or copolymerize. the monomer which has quarternary ammonium salt expressed with the monomer and/or formula (3) which have the third class amino group expressed with a formula (2) -- a polymerization -- How to carry out the polymerization of the Nonion nature vinyl monomer which can be copolymerized except the acrylic ester 50 shown by the formula (1) under existence of the becoming polymerization object (meta) thru/or the acrylic ester (meta) of the 100-mol % and the above at 0 thru/or 50-mol % of a rate, Furthermore, the acrylic ester expressed with a \*\* type (1) (meta) The quarternary ammonium salt shown by the monomer and/or formula (3) which have the third class amino group shown by 0 thru/or 50-mol % and a type (2) in the Nonion nature vinyl monomer which can be copolymerized except 50 thru/or the acrylic ester (meta) of the 100-mol % and the above A polymerization or approach \*\* to copolymerize is mentioned at a rate below 10 mol % in the monomer which it has. In addition, 100 mol % of the polymerization of acrylic ester shown by the formula (1) (meta) is meant zero mol%

of the Nonion nature vinyl monomers here.

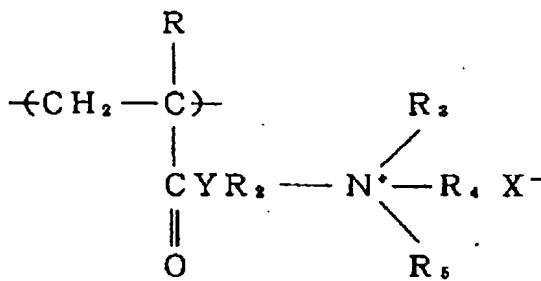
[0007] General formula (2)

[Formula 2]



[0008] General formula (3)

[Formula 3]



However, R is hydrogen or a methyl group, and R2. C1 – C4 An alkylene group or  $\text{CH}_2\text{CH(OH)}$   $\text{CH}_2$  It is shown. R3, R4, and R5 Hydrogen, or C1 – C4 An aliphatic series alkyl group or benzyl is shown. Y shows O or NH. X – An anion is expressed and they are halogen ion (a chloride ion, bromine ion, iodine ion, etc.), sulfate ion, alkyl-sulfuric-acid ion (methylsulfuric acid ion, ethyl-sulfuric-acid ion), alkyl or aryl sulfonic-acid ion, and acetic-acid ion. As for the polymerization object used by this invention, it is desirable to carry out coating to a base material independently, without mixing or blending with a pigment. By using a pigment together, it is because the water resisting property of ink jet record, lightfastness, electrophotography record fitness, etc. fall. the case where the polymerization object used by this invention is the polymer (100%) or copolymer of acrylic ester shown in a formula (1) (meta), and it is a copolymer -- the above-mentioned (meta) acrylic ester -- more than 50 mol % -- containing -- desirable -- more than 70 mol % -- containing is still more desirable. This can expect improvement in the concentration of a record image, if it is for the concentration of a record image to fall and the rate of acrylic ester (meta) is more than 70 mol % desirably, when the rate of the above-mentioned (meta) acrylic ester in an emulsion polymerization object is lower than 50-mol %. As an acrylic ester monomer expressed with a formula (1) (meta), a methyl acrylate (meta) and an ethyl acrylate (meta) are mentioned. As the Nonion nature vinyl monomer in which the copolymerization of those other than the above-mentioned (meta) acrylic ester is possible, For example, more than kinds, such as ethylene, butadiene, styrene, alpha methyl styrene, vinyl acetate, with a carbon numbers of three or more acrylic ester (meta), acrylamide (meta), N-methylol (meta) acrylamide, N, and N-dimethyl (meta) acrylamide, methylenebis acrylamide, acrylonitrile (meta), vinylpyridine, 2-hydroxyethyl (meta) acrylate, and 2-hydroxypropyl (meta) acrylate, can be copolymerized in the range which does not spoil the stability of a distributed object. As a cationic surface active agent containing the quarternary ammonium salt used by this invention, dodecyl trimethylammonium chloride, hexadecyl trimethylammonium chloride, octadecyl trimethylammonium chloride, tetradecyl dimethylbenzyl ammoniumchloride, octadecyl dimethylbenzyl ammoniumchloride, etc. are mentioned. As a monomer which has the third class amino group expressed with a formula (2), N and N-dimethylaminoethyl (meta) acrylate, N, and N-diethylaminoethyl (meta) acrylate, N, and N-dimethylaminopropyl (meta) acrylate, N, and N-dimethylamino-2-hydroxypropyl (meta) acrylate, N, and N-dimethylaminopropyl (meta)

acrylamide etc. is mentioned. As the monomer which has quarternary ammonium salt expressed with a formula (3), AKURO yloxy ECHIRUTORI methylanmonium chloride, (Meta) AKUROIRUOKISHI ethyl dimethylbenzyl ammonium chloride, (Meta) AKURO yloxy ECHIRUTORI ethyl ammonium chloride, (Meta) AKUROIRUOKISHIECHIRU diethyl benzyl ammoniumchloride, (Meta) AKUROIRUOKISHI propyl trimethylammonium chloride, (Meta) AKUROIRUOKISHI propyl triethyl ammoniumchloride, (Meta) 2-hydroxy-3-(meta) AKUROIRUOKISHI propyl trimethylammonium chloride, Acrylamidepropyl trimethylammoniumchloride, (Meta) Acrylamide propyl dimethylbenzyl ammonium chloride, (Meta) (Meta) Acrylamide propyl triethyl ammoniumchloride, acrylamide (meta) propyl JIECHIRUBENJIRU ammoniumchloride, 2-hydroxy-3-(meta) acrylamidepropyl trimethylammoniumchloride, etc. are mentioned.

[0008] Although paper is mentioned typically, cloth, various resin films like the polyethylene terephthalate resin film used for example, for an overhead projection, etc. can also be used that the thing suitable for ink jet record should just serve as a base material of a recorded material in this invention. the polymerization object used by this invention -- a base material -- receiving -- as coverage or the amount of impregnation -- solid content -- 0.05 - 2.5 g/m<sup>2</sup> -- desirable -- 0.1 - 1.5 g/m<sup>2</sup> Sufficient image concentration and waterproof effectiveness are discovered. It is possible to use a conventional method as it is as the method of application. That is, size press, a gate roll coater, an air knife coating machine, a blade coating machine, a spray, etc. can be used.

[0009]

[Function] Although the reason for demonstrating the effectiveness the polymerization object of this invention excelled [ effectiveness ] in the color enhancement of a record image and a water resisting property in ink jet record is not clear, it thinks in general as follows. Since it has a hydrophilic property, the distributed object which the short (meta) acrylic ester of the chain of this invention carried out the polymerization, and was able to do it is excellent in the absorptivity of water-soluble ink, while it acts as an organic loading material and often adsorbs the coloring agent in water-soluble ink. Moreover, since many of coloring agents used for the water-soluble ink of ink jet record as a present coloring agent are anionic colors, a color can be made to incorporate and combine and fix inside a polymerization object by making the polymerization object of this invention into cationicity. It is thought that the polymerization object of this invention is excellent in the color enhancement of a record image and a water resisting property in ink jet record for these reasons.

[0010]

[Example] Next, an example and the example of a comparison are given and this invention is further explained to a detail.

[0011] After agitating putting methyl methacrylate 64g, styrene 16.6g, cationic surface-active-agent cation AB(Nippon Oil & Fats make) 4g, and 200g of ion exchange water into the 4 Thu openings flask equipped with the synthetic [the synthetic example 1] thermometer, reflux condenser, and rabble of a polymerization object, and blowing nitrogen gas into it and heating to 60 degrees C, 2 and 2'-azobis (2-amidinopropane) hydronium chloride 0.2g is added, and it holds at 85 degrees C for 3 hours. The obtained polymerization object was an emulsion with a mean particle diameter of 340nm. ((A) Polymerization object)

[0012] After agitating putting styrene 8.3g, 25g [ of N,N-dimethylaminopropyl acrylamide ], 9.6g [ of acetic acids ], and cationic surface-active-agent cation BB(Nippon Oil & Fats make) 4g, and 300g of ion exchange water into the 4 Thu openings flask equipped with the [synthetic example 2] thermometer, the reflux condenser, and the rabble, and blowing nitrogen gas into it and heating to 60 degrees C, 2 and 2'-azobis (2-amidinopropane) hydronium chloride 0.1g is added, and it holds at 85 degrees C for 3 hours. After agitating putting in methyl methacrylate 64g and blowing nitrogen gas, after cooling to 50 degrees C and heating to 60 degrees C, 2 and 2'-azobis (2-amidinopropane) hydronium chloride 0.1g is added, and it holds at 85 degrees C for 3 hours. The obtained polymerization object was an emulsion with a mean particle diameter of 970nm. ((B) Polymerization object)

[0013] After agitating putting acrylamidepropyl trimethylammoniumchloride 33g, cationic surface-active-agent cation BB(Nippon Oil & Fats make) 4g, and 300g of ion exchange water into the 4 Thu openings flask equipped with the [synthetic example 3] thermometer, the reflux condenser,

and the rabble, and blowing nitrogen gas into it and heating to 60 degrees C, 2 and 2'-azobis (2-amidinopropane) hydronium chloride 0.1g is added, and it holds at 85 degrees C for 3 hours. After agitating putting in methyl methacrylate 64g and blowing nitrogen gas, after cooling to 50 degrees C and heating to 60 degrees C, 2 and 2'-azobis (2-amidinopropane) hydronium chloride 0.1g is added, and it holds at 85 degrees C for 3 hours. The obtained polymerization object was an emulsion with a mean particle diameter of 350nm. ((C) Polymerization object)

[0014] After agitating putting ethyl methacrylate 14.6g, acrylamide propyl dimethylbenzyl ammonium chloride 45.3g, cationic surface-active-agent cation BB(Nippon Oil & Fats make) 4g, and 300g of ion exchange water into the 4 Thu openings flask equipped with the [synthetic example 4] thermometer, the reflux condenser, and the rabble, and blowing nitrogen gas into it and heating to 60 degrees C, 2 and 2'-azobis (2-amidinopropane) hydronium chloride 0.1g is added, and it holds at 85 degrees C for 3 hours. After agitating putting in ethyl methacrylate 58.4g and blowing nitrogen gas, after cooling to 50 degrees C and heating to 60 degrees C, 2 and 2'-azobis (2-amidinopropane) hydronium chloride 0.1g is added, and it holds at 85 degrees C for 3 hours. The obtained polymerization object was an emulsion with a mean particle diameter of 670nm. ((D) Polymerization object)

[0015] After agitating putting acrylamide propyl dimethylbenzyl ammonium chloride 45.4g and 300g of ion exchange water into the 4 Thu openings flask equipped with the [synthetic example 5] thermometer, the reflux condenser, and the rabble, and blowing nitrogen gas into it and heating to 60 degrees C, 2 and 2'-azobis (2-amidinopropane) hydronium chloride 0.1g is added, and it holds at 85 degrees C for 3 hours. ((E) Polymerization object)

[0016] In this way, it mixed with the obtained polymerization object E at a rate of the polymerization object C solid weight ratio 1:1 obtained in the synthetic example 3, and the emulsion with a mean particle diameter of 950nm was obtained. ((F) Polymerization object)

[0017] The [synthetic example 6] polymerization object E and the polymerization object C were mixed at a rate of the solid weight ratio 1:3, and the emulsion with a mean particle diameter of 550nm was obtained. ((G) Polymerization object)

[0018] After agitating putting acrylamide propyl dimethylbenzyl ammonium chloride 20.4g, methyl methacrylate 64g, cationic surface-active-agent cation BB(Nippon Oil & Fats make) 4g, and 300g of ion exchange water into the 4 Thu openings flask equipped with the [synthetic example 7] thermometer, the reflux condenser, and the rabble, and blowing nitrogen gas into it and heating to 60 degrees C, 2 and 2'-azobis (2-amidinopropane) hydronium chloride 0.1g is added, and it holds at 85 degrees C for 3 hours. The obtained polymerization object was an emulsion with a mean particle diameter of 770nm. ((H) Polymerization object)

[0019] Acrylamidepropyl trimethylammoniumchloride 110g was put into the 4 Thu openings flask equipped with the [example 1 of comparison composition] thermometer, the reflux condenser, and the rabble, it dissolved in 110g of ion exchange water, and 0.3g of 1% water solutions of azobisisobutyronitril 0.23g and the polyoxyethylene nonyl ether was mixed as ethylenediamine 0.14g and a polymerization initiator. Agitated blowing nitrogen gas, and added 5.3g [ of potassium persulfate ], and 2% tetramethylethylenediamine 8.24g 1%, and it was made to react at 40 degrees C for 4 hours, and was made to react at 60 more degrees C for 2 hours. The acetone after reaction termination was added, separation washing was carried out, reduced pressure drying of the polymerization object was carried out, and the powdered polymerization object was obtained. Water was added to this and it considered as the water solution. ((I) Polymerization object)

[0020] Meta-acrylamidepropyl trimethylammoniumchloride 30g, N, and N-diethylamino ethyl methacrylate 10g, 2-hydroxypropyl acrylate 60g, isopropyl alcohol 50g, and 50g of water were put in, and nitrogen gas was blown into the 4 Thu openings flask equipped with the [example 2 of comparison composition] thermometer, the reflux condenser, and the rabble for 1 hour, agitating. Azobisisobutyronitril 1g is added after that and it heats to 60 degrees C. Nitrogen gas was agitated with through, it kept at 60 degrees C for 20 hours, the polymerization was performed, and the polymerization object was obtained. ((J) Polymerization object)

[0021] After agitating putting 11.5g [ of acrylic acids ], and methyl methacrylate 64g, styrene 16.6g, 0.5g of sodium dodecylbenzenesulfonate, and 300g of ion exchange water into the 4 Thu openings flask equipped with the [example 3 of comparison composition] thermometer, the reflux

condenser, and the rabble, and blowing nitrogen gas into it and heating to 70 degrees C, 0.1g of ammonium persulfates is added and it holds at 85 degrees C for 3 hours. The obtained polymerization object was an emulsion with a mean particle diameter of 140nm. ((K) Polymerization object)

[0022] A bar coating machine is used for the stencil for 100-micrometer [ in [example 1] basis weight 100 g/m<sup>2</sup> and thickness ], and Stockigt-sizing-degree 5 seconds for the 5 % of the weight water solution of solid content concentration of the polymerization object A, and it is desiccation solid content 1 g/m<sup>2</sup>. Coating was carried out so that it might become, and the record medium of this invention was produced. BJC-600J (Canon make) printed and estimated the ink jet record fitness of the above-mentioned record medium. The following items were followed about the solid printing section of each color as evaluation criteria.

\*\* Initial coloring concentration : it measured with the Macbeth reflection density plan RD 920.

\*\* Water resisting property : after carrying out the dipping of the sample after printing for 15 minutes into 25-degree C ion exchange water, concentration was measured with the Macbeth reflection density plan RD 920.

\*\* Lightfastness : after supplying the sample after printing to fade meter and irradiating at 60 degrees C for 40 hours, concentration was measured with the Macbeth reflection density plan RD 920.

Although the result was shown in a table 1, by applying the emulsion polymerization object obtained in the synthetic example 1, initial coloring concentration improved and a water resisting property and lightfastness were improved.

[0023] The polymerization objects B, C, D, F, G, and H were used instead of the [examples 2-7] polymerization object A, and also the record medium of this invention was produced like the example 1. Assessment of ink jet fitness was performed completely like the example 1. Although the result was shown in a table 1, by applying the polymerization objects B, C, D, F, G, and H, initial coloring concentration improved and a water resisting property and lightfastness were improved.

[0024] It considered as the example of a comparison, using the stencil (100-micrometer [ in basis weight 100 g/m<sup>2</sup> and thickness ], and Stockigt-sizing-degree 5 seconds) used for the [example 1 of comparison] examples 1-7 as it is. A result is shown in a table 1.

[0025]

[A table 1]

実験例	重合物	初期面積濃度				耐水性				耐光性			
		J	T	V	Y	J	T	V	Y	J	T	V	Y
実験例1	重合物A	1.29	1.17	1.21	1.16	1.23	1.11	1.15	1.10	1.10	0.99	1.03	0.99
実験例2	重合物B	1.34	1.20	1.23	1.21	1.28	1.14	1.22	1.15	1.15	1.02	1.09	1.03
実験例3	重合物C	1.35	1.25	1.31	1.26	1.28	1.18	1.28	1.20	1.15	1.06	1.10	1.07
実験例4	重合物D	1.36	1.28	1.30	1.27	1.30	1.19	1.28	1.24	1.19	1.15	1.20	1.18
実験例5	重合物F	1.42	1.35	1.42	1.39	1.39	1.38	1.37	1.34	1.37	1.32	1.39	1.35
実験例6	重合物G	1.44	1.37	1.45	1.40	1.36	1.35	1.34	1.30	1.38	1.35	1.38	1.36
実験例7	重合物H	1.34	1.28	1.31	1.28	1.27	1.19	1.24	1.21	1.16	1.07	1.10	1.09
比較例1	-	1.15	1.06	1.10	1.08	0.63	0.58	0.61	0.59	0.98	0.90	0.94	0.92
比較例2	重合物I	1.17	1.09	1.19	1.06	0.64	0.60	0.62	0.58	0.99	0.93	0.96	0.90
比較例3	重合物J	1.26	1.09	1.19	1.08	0.69	0.60	0.65	0.59	1.07	0.93	1.01	0.92
比較例4	重合物K	1.27	1.13	1.18	1.18	0.70	0.62	0.65	0.64	1.08	0.96	1.00	0.99

[0026] The polymerization objects I, J, and K were used instead of the [examples 2-4 of comparison] polymerization object A, and also the record medium was produced like the example 1, and it evaluated. A result is shown in a table 1.

[0027]

[Effect of the Invention] The recorded material of this invention has properties, such as excelling in color enhancement, a water resisting property, and lightfastness, when ink jet record is carried out.

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